DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N
PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999* Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2694 Advanced Digital Sensors	3,034	2,970	2,861	7,749	8,602	17,724	22,476	CONT	CONT
R2476 Framing Reconnaissance Camera	13,303	**15,883	1,898	0	2,907	0	0	2,907	33,991
TOTAL	**16,337**	**18,853**	**4,759**	**7,749**	**11,509**	**17,724**	**22,476**	**CONT**	**CONT**

Quantity of RDT&E Articles

*FY 1999 H2694 funds were executed under NAVAIR Project Unit H2675 and R2476 funds were executed under ONR Project Unit's R2476 & R2676
**FY 2000 budget for R2476 includes a Congressional add in the amount of $10M for E-O Framing Technologies and $4M for Hyperspectral Modular Reconnaisance which has been reduced by $89K for an Across-the-Board Reduction.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides funds for the development of sensor systems to improve present airborne reconnaissance capabilities. The developments are driven by evolving collection requirements and modern technology advances. The developments allow for the necessary changes required to meet an integrated, objective airborne reconnaissance architecture as defined in the Integrated Airborne Reconnaissance Strategy (IARS) and amplified in the Airborne Reconnaissance Information Technical Architecture (ARITA). Particular emphasis is placed on multi-platform interoperability. The Advanced Sensors Development Program implements successful proof-of-concept efforts accomplished in the Advanced Technology Program, other Service/Agency developments, and Congressionally-funded initiatives leading to producible sensor systems for airborne platforms. Upon successful sensor prototype demonstration, technology sensor developments are turned over to the Services for procurement and platform integration. The advanced sensor program includes technical analyses, systems engineering assessments, planning, and development for advanced airborne sensor systems. This effort focuses on developments, which support sensor system interoperability and standardization of multi-Service and multi-platform applications. The advanced sensor developments will provide the technology transition modules for operational use necessary for the overall migration of the airborne fleet (manned and unmanned) to a Joint Airborne SIGINT Architecture (JASA) (i.e., sensors, ground systems, data links, and platforms), and provide the mechanism required for timely dissemination of intelligence information to operational forces. The development and modification of the lead integration aircraft (EP-3E) for the initial JASA modules will provide a mechanism to begin development and operational assessment of the Joint SIGINT Avionics Family (JSAF) components. Coordinated and complementary airborne sensor development across the military Services and the Defense and Intelligence Agencies are being established for inclusion into the JASA. This sub-project also includes funding for U-2 sensor upgrades and multispectral imaging (MSI) developments.

(U) JUSTIFICATION OF BUDGET ACTIVITY: This program is categorized as Budget Activity 7 because it provides for the development of technologies and capabilities in support of Operational Systems Development and for the Navy's TARPS-CD and SHARP programs. For these Navy programs, technology to support the development of dual band (EO and IR) sponsors (emphasizing framing sensors) will be pursued. Future plans will expand the dual band capabilities of these sensors to MSI features.

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N
PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999* Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
H2694 Advanced Digital Sensors	3,034	2,970	2,861	7,749	8,602	17,724	22,476	CONT	CONT
TOTAL	3,034	2,970	2,861	7,749	8,602	17,724	22,476	CONT	CONT

Quantity of RDT&E Articles

*FY 1999 funds executed under NAVAIR Project Unit H2675.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides funds for the development of sensor systems to improve present airborne reconnaissance capabilities. The developments are driven by evolving collection requirements and modern technology advances. The developments allow for the necessary changes required to meet an integrated, objective airborne reconnaissance architecture as defined in the Integrated Airborne Reconnaissance Strategy (IARS) and amplified in the Airborne Reconnaissance Information Technical Architecture (ARITA). The advanced sensor program includes technical analyses, systems engineering assessments, planning, and development for advanced airborne sensor systems. This effort focuses on developments which support sensor system interoperability and standardization of multi-Service and multi-platform applications. The
EP-3E will undergo a series of block modification via an evolutionary acquisition process beginning in FY 2001. These block modifications have collectively been designated as the Joint SIGINT Avionics Family (JSAF) Modification Program (JMOD). The advanced sensor developments described herein will provide the technology transition modules necessary for the overall migration of the airborne fleet to a Joint Airborne SIGINT Architecture (JASA) (i.e., sensors, ground systems, data links, and platforms), and provide the mechanism required for timely dissemination of intelligence information to operational forces.

DATE: February 2000

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROJECT NUMBER: H2694**
PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD) **PROJECT TITLE: Advanced Digital Sensors**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

(U) ($1,113) Continued joint Phase III Common Processor Core (CPC) development

(U) ($ 180) Procured two CPC capable EPR-208s for SIL/Aircraft Integration & Test

(U) ($ 935) Continued Story Finder software hardware development and conducted Preliminary Design Review (PDR)

(U) ($ 806) Initiated Story Maker Fusion software requirements analysis

2. FY 2000 PLAN:

(U) ($ 890) Initiate joint Common Processor Core (CPC) Phase IV Development

(U) (($ 962) Complete Story Finder development and Conduct Critical Design Review (CDR)

(U) ($ 160) Initiate Story Book CPC Phase I-III JSAF MOD 1 Software Integration Lab (SIL) Integration and Test

(U) ($ 210) Continue Story Finder JSAF MOD 1 SIL Integration and Development Test (DT) and Operational Assessment (OA)

(U) ($ 163) Initiate Story Book CPC Phase I-III JSAF MOD 1 aircraft integration

(U) ($ 160) Initiate Story Finder JSAF MOD 1 aircraft integration

(U) ($ 425) Complete Story Maker fusion software requirements analysis

3. FY 2001 PLAN:

(U) ($ 520) Initiate Story Maker fusion software development

(U) ($1,066) Complete Story Finder JSAF MOD 1 aircraft integration

(U) ($ 320) Complete Story Book CPC Phase I-III JSAF MOD 1 aircraft integration

(U) ($ 292) Conduct Story Finder DT/Operational Test (OT) on EP-3E JSAF MOD 1 aircraft

(U) ($ 300) Conduct Story Book CPC Phase I-III DT/OT on EP-3E JSAF MOD 1 aircraft

(U) ($ 363) Continue joint Common Processor Core (CPC) Phase IV Development

DATE: February 2000

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROJECT NUMBER: H2694**
PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD) **PROJECT TITLE: Advanced Digital Sensors**

(U) B. PROGRAM CHANGE SUMMARY

	FY 1999*	FY 2000	FY 2001
(U) FY 2000 President's Budget:	3,048	2,986	6,921
(U) Appropriated Value:	3,055	2,986	
(U) Adjustments from Pres Budget:	-14	-16	-4,060
(U) FY 2001 President's Budget Submit:	3,034	2,970	2,861

* FY 1999 funds executed under NAVAIR Project Unit H2675.

CHANGE SUMMARY EXPLANATION:

(U) The FY 1999 decrease of $14 thousand is for inflation savings. The FY 2000 decrease reflects a $16 thousand reduction for an Across-the-Board Congressional recision. The FY 2001 net decrease of $4,060 thousand includes a $8K decrease for Navy Working Capital Fund (NWCF), a $3 thousand increase for Military and Civilian pay, a $30 thousand decrease for revised economic assumptions, and a $4,025 thousand reduction for reprioritization of requirements within the Navy.

(U) Schedule: The FY 1999 schedule change combined the 2Q/99 Story Finder Review and the 4Q/99 Story Book Review into the 3Q JSAF Mod 1 Preliminary Design Review (PDR). FY 2000 added a Critical Design Review (CDR) for JSAF Mod 1 (1Q/00) and redefined the 2Q/00 Development Test (DT) and Operational Assessment (OA) as the JSAF Mod 1 Software Integration Lab (SIL) DT/OA. FY 2001 and To Complete reflects the rebaseline of the program to EP-3E JSAF Block Mod Upgrades.

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY

APPN	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN5 EP-3E OSIP 01-01			25,335	27,268	88,199	34,009	35,905	198,687

DATE: February 2000

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROJECT NUMBER: H2694**
PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD) **PROJECT TITLE: Advanced Digital Sensors**

Related RDT&E (Not applicable)

(U) D. ACQUISITION STRATEGY: Leverages/complements Air Force, Naval Research Laboratory, Office of Naval Research RDT&E efforts for technology insertions into EP-3E/VPU productions programs.

(U) E. SCHEDULE PROFILE

	FY 1999	FY 2000	FY 2001	TO_COMPLETE
(U) Program Milestones			2Q/01 LRIP(2) for JSAF MOD 1 (Story Book and Story Finder)	2Q/02 JSAF MOD 1 FRP (Story Book and Story Finder) (MS III)
(U) Engineering Milestones	3Q/99JSAF MOD 1 (Story Finder /Book) PDR	1Q/00JSAF MOD 1 (Story Finder /Book) CDR		
(U) T&E Milestones		4Q/00JSAF MOD 1 SIL DT/OA	3Q/01 JSAF MOD 1 Acft DT/OT	3Q/02 JSAF MOD 2 acft DT/OT (Story Maker)
(U) Contract Milestones				

EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS **DATE: February 2000**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROJECT NUMBER: H2694**

PROJECT TITLE: Advanced Digital Sensors

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Story Finder	CPFF	BTG, Vienna, VA;		580	Apr 99					0	580	580
	CPFF	Sub-Melborne Raytheon Systems		236	May 99	884	Mar 00	906	Dec 00	0	2,026	2,026
CPC Development	CPFF	Raytheon, Greenville, TX		1,047	Aug 99	650	Mar 00	200	Dec 00	CONT	CONT	CONT
Fusion Software Development	CPFF	GTE, Sunnyvale, CA		721	Jul 99	325	Feb 00	320	Dec 00	CONT	CONT	CONT
Subtotal Product Development				**2,584**		**1,859**		**1,426**		**CONT**	**CONT**	
Remarks:												
System Engineering	CPFF	GRCI		400	Sep 99	400	Feb 00	400	Dec 00	CONT	CONT	CONT
Systems Engineering	WX	NAWC WD, China Lake, CA				253	Feb 00	200	Dec 00	CONT	CONT	
Subtotal Support				**400**		**653**		**600**		**CONT**	**CONT**	
Remarks:												
Test and Evaluation	WX	NAWC AD, Pax River, MD				50	Feb 00	592	Dec 00	**CONT**	**CONT**	
Subtotal Test & Evaluation						**50**		**592**		**CONT**	**CONT**	
Remarks:												
Technical Support	WX	NAWC AD, Pax River, MD		50	Jun	408	Jan 00	243	Dec 00	CONT	CONT	
Subtotal Management				**50**		**408**		**243**		**CONT**	**CONT**	
Remarks:												
Total Cost				**3,034**		**2,970**		**2,861**		**CONT**	**CONT**	

DATE: February 2000

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD)** **PROJECT NUMBER: R2476** **PROJECT TITLE: Framing Reconnaissance Camera**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	To Complete	Total Program
R2476 Framing Reconnaissance Camera	13,303	15,883	1,898	0	2.907	0	0	0	0	33,991
TOTAL	**13,303**	**15,883**	**1,898**	**0**	**2,907**	**0**	**0**	**0**	**0**	**33,991**

*FY 1999 funds were executed under ONR Project Unit's R2476 & R2676

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: There are two primary objectives for the Advanced Technology funding: (1) to evaluate the utility and maturity of technology for airborne reconnaissance applications, and (2) to reduce the risk of employing emerging technologies in system upgrades, new system acquisitions, or Advanced Concept Technology Demonstrations (ACTDs), by integrating and exercising them in developmental and operational tests. These technologies help satisfy the requirements of the objective architecture set forth in the Integrated Airborne Reconnaissance Strategy (IARS). These technology investments are also identified in the Airborne Reconnaissance Technology Program Plan (ARTPP), published in November 1994. They were carefully selected from a broad range of technologies to provide utility to the warfighter at acceptable levels of cost and risk. This project continues technology transition programs in the critical areas identified in the ARTPP. This program leverages the commercial base at every opportunity while investing in carefully selected DoD-unique areas. Additionally, it defines near-term demonstrations in specific areas, followed by ones in which the most promising technology is chosen from a pool of possibilities currently under investigation within government and commercial sectors. Transition of sensors to AF TARS, and Navy TARPS-CD and SHARP programs has been successfully achieved.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

(U) ($4,513) Completed development, tested and flown 100 megapixel cameras.

(U) ($4,100) Initiated development of dual band EO/IR camera.

(U) ($3,400) Continued development of downsampled JPEG image compression boards.

(U) ($1,290) Initiated demonstration with precision strike capability.

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD)** **PROJECT NUMBER: R2476** **PROJECT TITLE: Framing Reconnaissance Camera**

2. **FY 2000 PLAN:**

(U) ($ 172) Test compression boards

(U) ($1,400) Begin flight test of dual band EO/IR camera

(U) ($ 400) Test precision strike capable camera

(U) ($9,936) Develop E-0 Framing Technologies

(U) ($3,975) Develop Hyperspectral Modular Reconnaissance

3. FY 2001 PLAN:

(U) ($1,200) Complete flight test and evaluation of dual band EO/IR camera

(U) ($ 698) Flight demonstration of precision strike capable reconnaissance camera

(U) B. PROGRAM CHANGE SUMMARY

	FY 1999	FY 2000	FY 2001
(U) FY 2000 President's Budget:	13,363	1,972	1,968
(U) Appropriated Value:	13,393	16,972	0
(U) Adjustments from Pres Budget:	-60	+13,911	-70
(U) FY 2001 President's Budget Submit:	13,303	15,883	1,898

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 decrease of $60 thousand is for inflation savings. The FY 2000 reflects a Congressional add in the amount of $10M for E-O Framing Technologies and $4M for Hyperspectral Modular Reconnaisance which has been reduced by $89K for an Across-the-Board Reduction. FY 2001 net decrease of $70 thousand includes a $7 thousand rebalancing decrease, $44 thousand decrease for Navy Working Capital Fund (NWCF), a $2 thousand increase for Military and Civilian pay, $21 thousand decrease for revised economic assumptions.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
Related RDT&E								
F/A-18 SHARP	$29,845K	$30,558K	$25,588K	$22,612K	$1,966K			
HISTAR	$3,200K	$3,200K						

(U) D. ACQUISITION STRATEGY:

(U) E. SCHEDULE PROFILE

	FY 1999	FY 2000	FY 2001
(U) Program Milestones			
(U) Engineering Milestones	3Q/Begin dual band Sensor Development	4Q Begin dual band camera flight tests 3Q Test compression boards 3Q Test precision strike capable camera	2Q Complete flight test of dual band camera 3Q Precision Strike flight demonstration
(U) T&E Milestones			
(U) Contract Milestones			

EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS **DATE: February 2000**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROJECT NUMBER: R2476**

PROJECT TITLE: Framing Reconnaissance Camera

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
100 Megapixel Camera Testing	CPFF, competitive	Recon Optical Lockheed Martin		4,513							4,513	
Compressionboards	CPFF, competitive	Space Dynamics Lab		3,400	2Q/99	0		0		0	3,400	
Precision strike	CPFF, competitive	1 TBD Contractor		1,290	2Q/99	400	1Q00	600	1Q01	2,500	4,790	
Dual Band EO/IR camera	CPFF, competitive	Lockheed Martin Recon Optical		4,100	2Q/99	1,400	1Q/00	1,200	2Q01	150	6,850	
Technical support	CPFF	Various	0	0	1Q/99	172	1Q/00	98	1Q01	257	557	
E-O framing technologies						9,936					9,936	
Hyperspectral Modular Reconnaissance						3,975					3,975	
Subtotal Product Development			**0**	**13,303**		**15,883**		**1,898**		**2,907**	**33,991**	

Remarks: Direct support of system analysis and product development via in-house support, contracts, and contracted services.

Subtotal Support			**0**	**0**		**0**		**0**		**0**	**0**	**0**

Remarks:

EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS **DATE: February 2000**

BUDGET ACTIVITY: 7 **PROGRAM ELEMENT: 0305206N** **PROJECT NUMBER: P809**

PROJECT TITLE: Framing Reconnaissance Camera

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
										0	0	0
Subtotal Test & Evaluation			**0**	**0**		**0**		**0**		**0**	**0**	**0**
Remarks:												
Travel			0	0		0		0		0	0	0
Subtotal Management			**0**	**0**		**0**		**0**		**0**	**0**	**0**
Remarks: TDY associated with product development efforts.												
Total Cost			**0**	**13,303**		**15,883**		**1,898**		**2,907**	**33,991**	**0**